

LAND MOLLUSCA FROM CONEYBURY HENGE, WILTSHIRE

By

Martin Bell and Julie Shackleton.

Coneybury Henge lies at just over 107 m on the Upper Chalk (Geological Survey Sheet 298) of Wessex on the west flank of the River Avon (Royal Commission on Historical Monuments 1979, p.13). It was partly excavated during the summer of 1980 by Julian Richards for the Wessex Archaeological Committee as part of their Stonehenge Environs Project. Archaeological horizons were restricted to a large enclosing ditch, a sizable pit predating the henge and some shallow features. No trace of a bank survived, consequently there was no old land surface from which evidence of the pre-enclosure environment could be obtained. Analytical work had perforce to be restricted to a major column of samples from the ditch and three spot samples from the features.

The methods of mollusc analysis employed are basically those outlined by Evans (1972) and the nomenclature follows Waldén (1976). The molluscs were generally in a good state of preservation although somewhat encrusted by a calcareous deposit. The chief difficulty of identification was to distinguish between the numerous small apical fragments of Aegopinella pura and Aegopinella nitidula. The results are shown in Table 1 and as histograms of relative abundance (Fig.1) in which each species is plotted as a percentage of the total individuals excluding the burrowing species Cecilioides acicula which is plotted as a percentage over and above the rest of the assemblage.

During the course of mollusc analysis the sediments were divided into various fractions on sieves. These fractions have been grouped into three: particles larger than 5.6 mm; particles between 5.6 mm and 0.5 mm; and particles smaller than 0.5 mm. When plotted graphically (Fig.2) this provides a crude index of the extent of physical weathering and sorting within the ditch sediments. Also represented on the same diagram are the numbers of molluscs per kilogramme of soil, which, by comparison with the sedimentological sequence, helps to provide some indication of the speed with which the various layers accumulated and the extent to which conditions at the time favoured molluscan life. Another adjunct to interpretation is the index of species diversity which is also plotted on Fig.2. This has been calculated using the Shannon-Wiener function, a mathematical formula which provides a quantitative measure taking account both of the number of taxa in a sample and the evenness of abundance of those taxa (Krebs 1972, p.506). This has been calculated at the suggestion of Dr. John Evans and these and other calculations involved in mollusc analysis have been considerably speeded up by the MOLCALC-PET programme which has been prepared at Bristol by David Maguire. Calculation of the Shannon-Wiener function is an aid to interpretation because, regardless of the individual ecological preferences of the species involved, we can predict that a complex ecosystem with a range of niches (e.g. broadleaved woods with several storeys of vegetation) will have a high index of diversity compared to a simple ecosystem with few niches (e.g. arable land). Useful as this measure of diversity is, we must clearly exercise caution in applying it to sub-fossil

assemblages where, depending on the context, we face varying levels of uncertainty as to whether all the species lived together as an ecological community at one time and place.

The Ditch

A full description of the ditch sediments at the point sampled is contained in Dr. Keeley's (1981) report on soil studies. The following is an abbreviated outline of the main layers. Descriptive and quantitative terms (e.g. moderately stony) follow Hodgson (1976) and the tripartite classification of ditch sediments (primary, secondary and tertiary) is that outlined by Evans (1972, pp.321-328) and Limbrey (1975, pp.290-300).

Depth

- 0-20 cm. Modern plough Rendzina top soil - Context 1.
- 20-78 cm Dark yellowish brown (10 YR 4/4) silty, clay loam, moderately stony with both chalk and flints. A lack of sorting suggests this is a colluvial ploughwash deposit; the tertiary fill - Contexts 538, 1065.
- 78-89 cm Lens of small and medium rounded chalk pieces, probably derived from levelling of the bank - Context 1421.
- 89-100 cm Dark brown (10 YR 3/3) friable clay loam with few stones; a stabilization horizon sorted to a limited extent by earthworm activity - Context 1444.
- 100-110cm Stone accumulation layer at base of stabilization horizon, poorly represented in the field but demonstrated by the sedimentological graph (Fig.2).

- 110-176 cm. Brown (10 YR 5/3) clay loam moderately stony with both flints and chalk, poorly sorted; the secondary fill; Contains Beaker pottery - Context 487.
- 176-195 cm. Medium sized chalk lumps in a matrix of calcium carbonate. This layer and below represents the primary fill - Context 1420.
- 195-273 cm. Medium and large chalk lumps with many voids. Within the layer were three bands of coarse chalk rubble separated by two bands of finer rubble.
- 273-278 cm. Very dark greyish brown (10 YR 3/2) clay loam with common chalk pieces. Possibly a turf which had collapsed into the ditch - Context 2305.
- 278-300 cm. Medium chalk lumps - Context 2306.

The primary fill contained very few molluscs (generally less than 10 per sample) and these samples have been omitted from the histograms (Fig.1). In any case the molluscs concerned were probably weathered from the ditch sides and are of little value for interpretation. Of more interest is the soil lens at 272-278 cm which was interpreted in the field as a possible collapsed turf. Analysis did not, however, support this interpretation since a large soil sample weighing 3.5 kg contained only 58 molluscs, far fewer than one might expect in topsoil. More probably the lens represents sub-soil from the pre-henge soil profile which has fallen, or been washed, into the ditch. Pomatias elegans is the most abundant species, it is often found in conditions of clearance and broken ground such as probably accompanied construction of the henge, alternatively its importance here may be explained by its tendency to become concentrated

in subsoil horizons. The other species present include Carychium tridentatum, Acanthinula aculeata, Vitrina pellucida, the Zonitidae and Clausilia bidentata which generally prefer shady conditions. With these, however, are Vallonia excentrica and Helicella itala which like open conditions. Interpretation is made difficult, both by the small number of individuals and by a degree of uncertainty as to whether they were all derived from the same horizon in the pre-henge soil. All we can do is to record the presence of shade-loving and open country elements and see how this compares to assemblages from overlying horizons.

The secondary fill between 110 and 176 cm produced much larger numbers of molluscs and a higher index of diversity (mean = 3.6) than the other layers. Clearly the sediments accumulated relatively slowly and conditions were highly favourable for molluscan life. Throughout this period the assemblage is characterised by an abundance of Carychium tridentatum accompanied by large numbers of Discus rotundatus, Aegopinella pura, Vitrea contracta and Vallonia costata. There is also evidence for a small degree of ecological change through the secondary fill. Helicella itala and some catholic species are more abundant at the base, as are Punctum pygmaeum and Nesovitrea hammonis which Evans (1982, p.331) reports as abundant in the early stages of ditch colonization by plants. Subsequently, towards the middle of the secondary fill, Pupilla muscorum, Vallonia costata and Helicella itala decrease and there is a corresponding increase in the proportions of Carychium tridentatum, Discus rotundatus and to a lesser extent Oxychilus cellarius and Aegopinella nitidula which suggests some further increase in shade. The trend is a minor

one, however, and throughout the secondary fill the assemblage is predominantly one of shade-loving species which account for a mean of 63% (using categories in Evans 1972, p.194). Associated with these are some 15% of species in the open country category. The only one of these which is consistently important is Vallonia costata which does occur at similar levels of abundance in open woodland. This is not the case, however, with Helicella itala which has been described as 'the most characteristically open country species' (Evans 1972, p.180) and occurs in small proportions in all samples.

We must now consider to what extent the predominantly shade-loving assemblage in this layer reflects a more shady microenvironment in the ditch as opposed to general site conditions. If the assemblage had been the result purely of shade and lush vegetation in a ditch set within an otherwise open landscape, one can predict, on the basis of sites where it is possible to compare palaeosol and ditch assemblages, that there would be a much greater proportion of open country species (Thomas 1982). It might also be anticipated that the lower part of the secondary fill would produce a largely open assemblage and the proportion of shade-loving species would increase as vegetation colonized the ditch. Instead it is evident that a plant cover creating shady conditions was already present when the secondary fill began to accumulate. More problematical is the nature of the plant community. Tall ungrazed grassland has, for instance, been shown to support faunas similar in some respects to those from woodland (Cameron and Morgan-Huws, 1975). Such faunas tend to be rich in Carychium tridentatum, Vitrea contracta and Aegopinella pura which are all abundant in these samples. Tall

grassland faunas do not, however, contain Discus rotundatus, Aegopinella nitidula, Acanthinula aculeata, Oxychilus cellarius and the Clausiliidae which are present here. Further evidence that the relatively rich assemblage is not purely the result of lush grass in the sedimenting ditch comes from the sediments themselves. Lush grass implies stable conditions but the 66 cm of poorly sorted sediment clearly suggests conditions which were far from stable. Taken in aggregate the evidence indicates that during the Beaker period shady conditions were created at least partly by shrubs and trees. Leaf litter accumulating in the ditch would account neatly for the large numbers of Carychium tridentatum. Patches of bare ground are implied by the sediments and those on the weathered bank could have created a favourable niche for Helicella itala.

A further aspect of the secondary ditch fill assemblage which deserved mention is the occurrence of a single example of Oxyloma pfeifferi at 110-115 cm. This is anomalous because the species is one of fens, marshes and wet places (Kerney and Cameron 1979, p.60). Suitable habitats would almost certainly have existed in the Avon valley 0.7 km to the south-east. A solitary individual might have been brought here by a bird or mammal but it is much more likely that it was imported by man along with reeds or some other raw material from the valley.

At the very top of the secondary fill and into the stone accumulation zone of the overlying stabilization horizon an abrupt change occurs. There is a minor peak in mollusc numbers as one would expect in a stabilization horizon but a gradual decrease in species diversity. All the shade-loving species decline rapidly and never

achieve major representation again. In the early stages of this decline there is a minor peak of Pomatias elegans, which is favoured by clearance episodes and disturbed conditions. Following this is a rapid increase in open country species: Pupilla muscorum, the Vallonias, Helicella itala and Vertigo pygmaea. From these species we can infer that conditions at the time of the stabilization horizon were open, dry and most probably short grassland. The reasonably large number of molluscs per kilogramme (up to 900) is probably more an indication that the layer formed over a long period rather than evidence that the environment was particularly favourable for molluscs.

It was therefore probably some considerable time after the removal of woody vegetation that a second aspect of clearance occurred. This is represented by the sedimentological evidence for levelling of the bank into the ditch to form the chalk lens at 78-89 cm. Then followed the deposition of 78 cm of colluvial soil during which time there was a gradual decrease in the numbers of molluscs and correspondingly in the index of diversity. The assemblage is a restricted one dominated by Pupilla muscorum, Limacidae, the Vallonias and Helicella itala. Some parallels can be seen with assemblages in lynchet deposits (e.g. Evans 1972, p.319; Thomas 1977, p.262) and colluvial valley fills of arable origin (Bell 1981). These generally have large numbers of Vallonias with Vallonia excentrica predominating over Vallonia costata as in this case. Where they differ from the present sediments is in having more Trichia hispida and smaller numbers of Pupilla muscorum which seems to shun intensive agriculture (Evans 1972, p.146). This could suggest

that brief grassland episodes interrupted the arable activity represented by the tertiary fill. If so the horizons in question must have been mixed during subsequent cultivation for there is no hint of stabilization horizons either from the sediments or the histogram of mollusc abundance.

At c. 30 cm the situation changes, Pupilla muscorum declines very suddenly and almost vanishes and there is a corresponding increase in Limacidae, Helicella itala and Candidula gigaxii. This change is probably the result of dryer and more intensive arable conditions during recent times. Candidula gigaxii is a species which was introduced in Medieval times (Kerney 1966) and quickly became a major colonizer of dry exposed habitats on the chalk. Small numbers of this species down to the stabilization horizon could mean that the whole of the tertiary fill is the result of cultivation which is known to have occurred on the site in Medieval and Post-Medieval times (Royal Commission on Historical Monuments 1979, p.13). More probably the few examples below 30 cm may be the product of a small degree of biogenic disturbance which has been shown to occur in similar deposits in dry valleys (Bell 1981, p.374).

The Features

Outside the henge a large pit was excavated and found to contain an early Neolithic artifact assemblage. One sample was examined from a soil layer within the fill (Context 2507) in an attempt to obtain evidence about the pre-henge environment. Interpretation of feature fills of this kind is hazardous, clearly most of the molluscs did not actually live in the features but were derived from

possibly multiple contexts round its periphery, these might easily have included earlier sub-soil features. The assemblage does, however, have a close general similarity to that from the secondary fill of the ditch. In terms of Evans' (1972, p.194) ecological groups 51% are woodland species, 23% of catholic ecological preferences and 25% open country. Thus the proportion of open country species and particularly of Helicella itala is slightly greater than all but the very basal sample of the secondary fill. We may infer from this that there is no evidence that the early Neolithic environment was dramatically different from that of the later Neolithic and Beaker period and that areas of shade are likely to have existed.

Within the henge two shallow subsoil features of irregular shape were tentatively interpreted in the field as former tree holes possibly relating to an earlier woodland episode. Analysis did not support this hypothesis. In the sample from context 1602/1242 the predominant species are the Vallonias, Helicella itala and Pupilla muscorum; together open country species comprise 47% of the assemblage with shade-loving types, particularly Discus rotundatus, forming 31%. The closest match with the ditch sequence is with the bottom of the stabilization horizon. The second subsoil hollow (Context 1798) produced a smaller number of species with a low index of diversity and a species composition corresponding to the tertiary fill of the ditch. The main species were Helicella itala, the Vallonias and the Limacidae. These features are not, therefore, the eroded relics of climax woodland, but more probably the result of minor scrub growth in post Neolithic times.

Conclusions

The absence of a pre-henge soil is most unfortunate. The only evidence we have for the pre-henge environment comes from two isolated samples: one from the early Neolithic pit (Context 2507), the other from the soil lens at 273-278 cm in the primary ditch fill. Unsatisfactory as these two contexts are for mollusc analysis, they do hint at the existence of some shade in the pre-henge environment. More satisfactory evidence pointing in the same direction comes from the base of the secondary fill, since most of the woodland species were clearly on hand to colonize the site, and form the predominant aspect of the assemblage at the lowest level of the secondary fill. Some importance attaches therefore to the timescale for accumulation of the primary fill. Judging by the Overton Down Experimental Earthwork (Crabtree 1971) this is likely to have accumulated in a few (possibly less than twenty) years. Indeed the suggestion of alternating coarse and fine sediments resemble the annual bands observed in the Overton ditch. If this timescale is accepted then it seems likely that shady habitats were present close to the site at the time of construction. We cannot, however, assume that the monument was constructed in woodland. A warning against making this assumption comes from the Mount Pleasant Henge (Evans and Jones 1979) where we can compare evidence from the old land surface and ditch. The old land surface showed the monument had been constructed, following woodland clearance, in a grassland environment. However, a stratification horizon at the base of the secondary fill had a shade-loving assemblage which contained little clear indication of the foregoing grassland episode. This indicates that, had the Coneybury Henge been constructed

in a clearing which then became overgrown, it is by no means certain that the earlier episode would register at the base of the secondary fill. What we can say is that if the henge was constructed in a cleared area then that area is likely to have been of small size and seems to have become overgrown within a generation. Shady conditions certainly obtained at the time of the site's Beaker utilization.

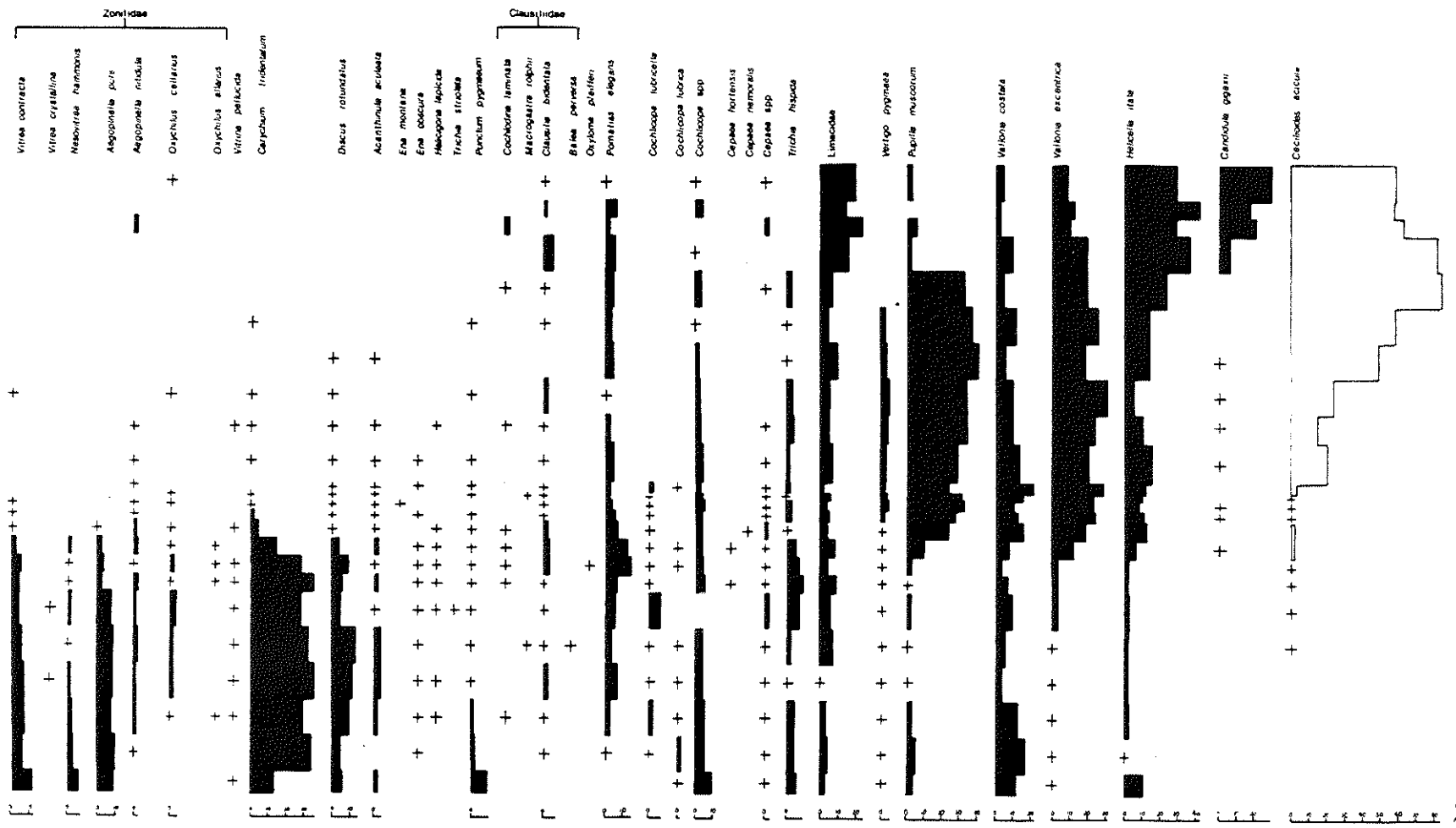
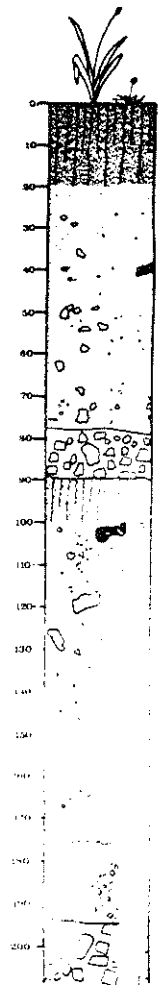
It remains to compare the Coneybury sequence with that from other henges. Most were constructed after forest clearance in an open grassland environment, often of fairly long standing. No evidence has survived to show that this was the case at Coneybury and the speed of colonization by shrubs and trees implies that shade survived not far away in the pre-henge environment. Other henges in the area of the Stonehenge Environs Project have produced molluscan evidence that they were constructed in grassland, this was the case at Durrington Walls (Evans 1971) and Woodhenge (Evans and Jones 1979) and a similar environment has been inferred from the soil profile below the bank of Stonehenge itself (Evans 1978). Similar pre-henge grassland environments have been demonstrated at Avebury (Evans 1972), Mount Pleasant (Evans and Jones 1979) and Priddy (Dimbleby 1967). Only at Condicote on the Cotswold limestone do we have a ditch assemblage with a predominantly shade-loving fauna in the primary fill which implies that the monument may have been constructed in woodland (Bell 1980). Fewer post-construction ditch sequences have been obtained. An entirely open landscape was maintained at Woodhenge but Coneybury, Condicote and Mount Pleasant were colonized by shrubs and woodland in the period

following construction. It remains to be established whether this represents a reduced level of land utilization in late Neolithic/Beaker times or is simply a reflection of a fairly complex mosaic of vegetation types on the chalk and limestone during Neolithic and Bronze Age times.

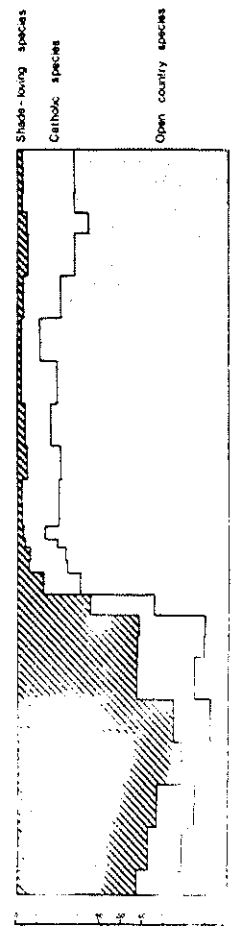
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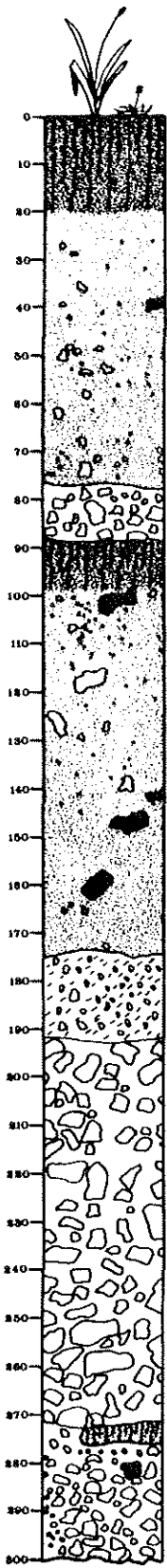
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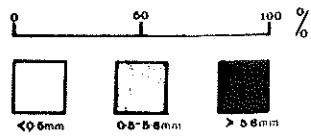
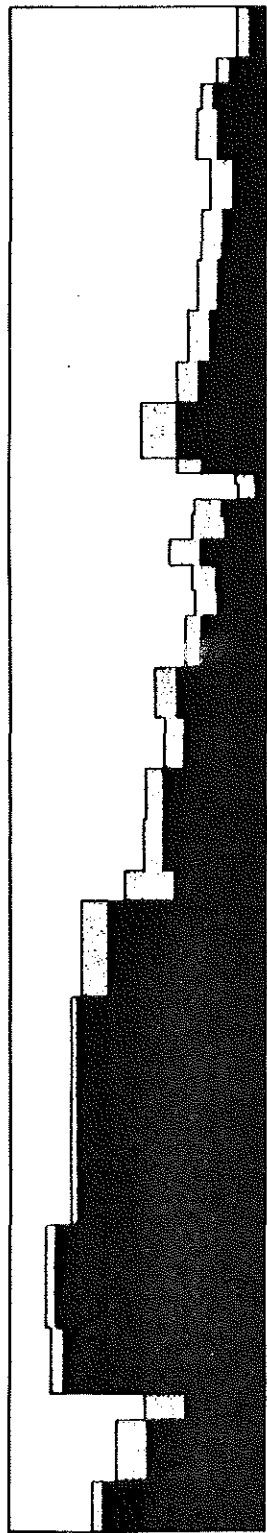
Coneybury Henge



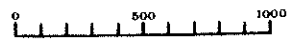
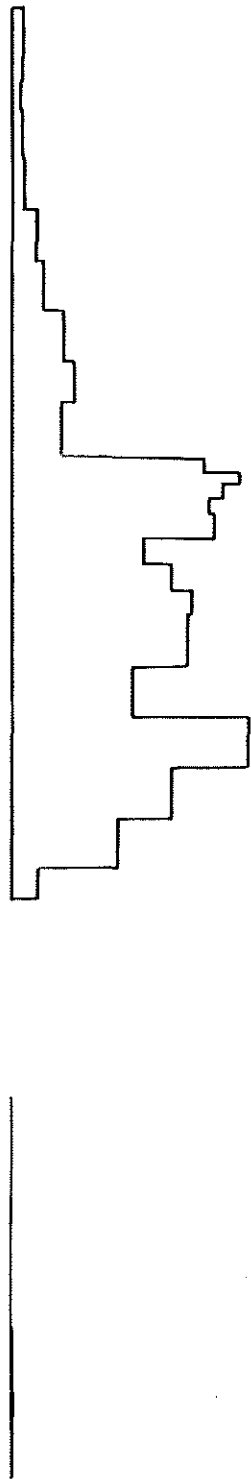
Ditch



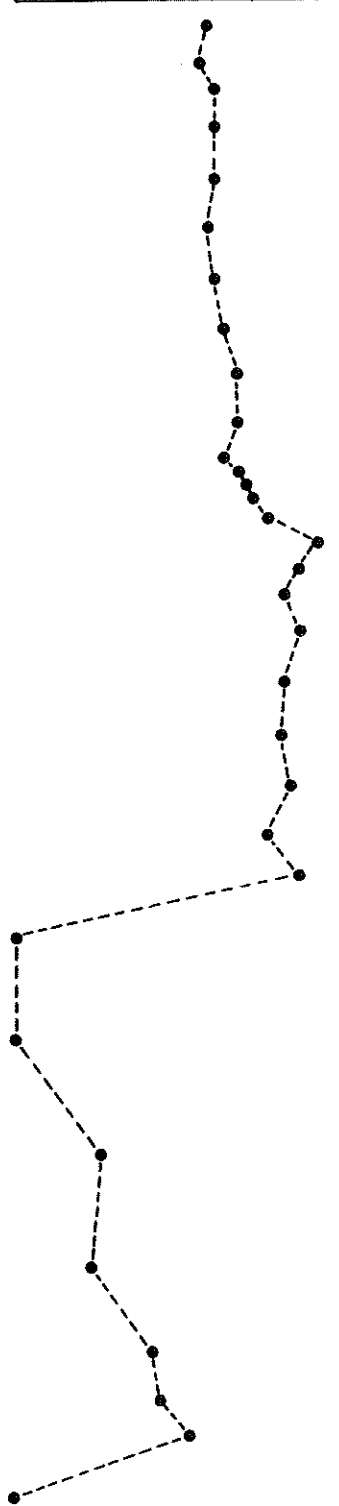
Particle size



Molluscs per kg.



Index of species diversity



Coneybury

Henge

Ditch